



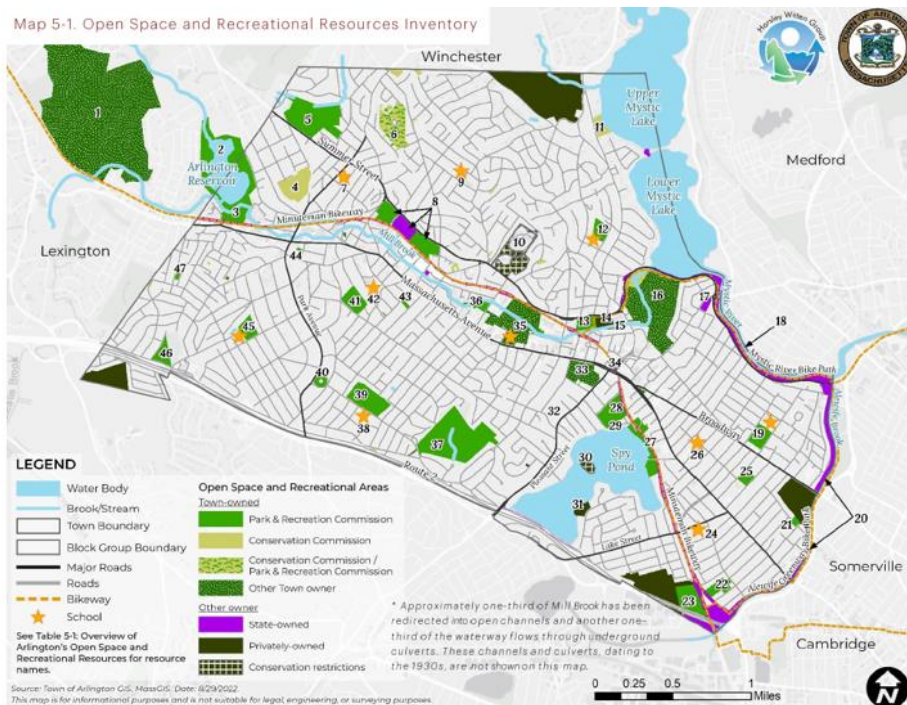
TOWN OF ARLINGTON MASSACHUSETTS

DEPARTMENT OF PLANNING & COMMUNITY DEVELOPMENT

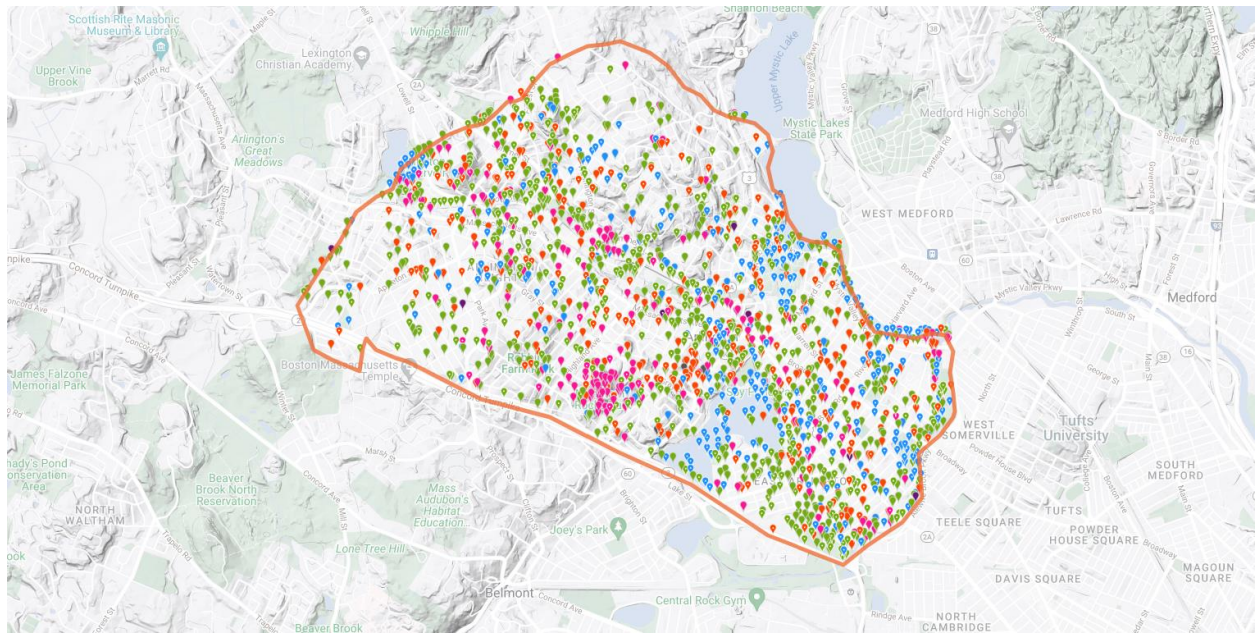
URBAN ECOLOGY FRAMEWORK

The world is in the middle of a biodiversity crisis. We’re on track for a sixth mass extinction—the first such event in 65 million years, which was the time when dinosaurs died off along with 76% of Earth’s species. The gravity of this fact, and the impact to humans, are only beginning to be recognized in policy and planning circles. Declining biodiversity is an emerging topic in climate change conversations and planners and policy makers are seeking remedies. The Town of Arlington seeks to reassess its ecological land management plans in light of this crisis and conduct research to determine how biodiversity can be enhanced at the municipal scale.

Arlington has made strides in climate mitigation and adaptation. The Town has been at the cutting edge of addressing mitigation issues like banning fossil fuels in new development, getting utilities to repair methane gas leaks, and setting ambitious net zero goals. Arlington is adapting to climate change by planning for hazard mitigation, managing stormwater using climate-smart practices, and establishing strong protections for open space and ecologically sensitive areas. Separately, the Town has set goals and actions for ecological land management. These include using more native vegetation in landscaping, managing for invasive species, reducing nutrient inputs to water bodies from fertilizers, and so forth. To address the biodiversity crisis at a higher level, these goals need to be unified and complemented by further strategy.

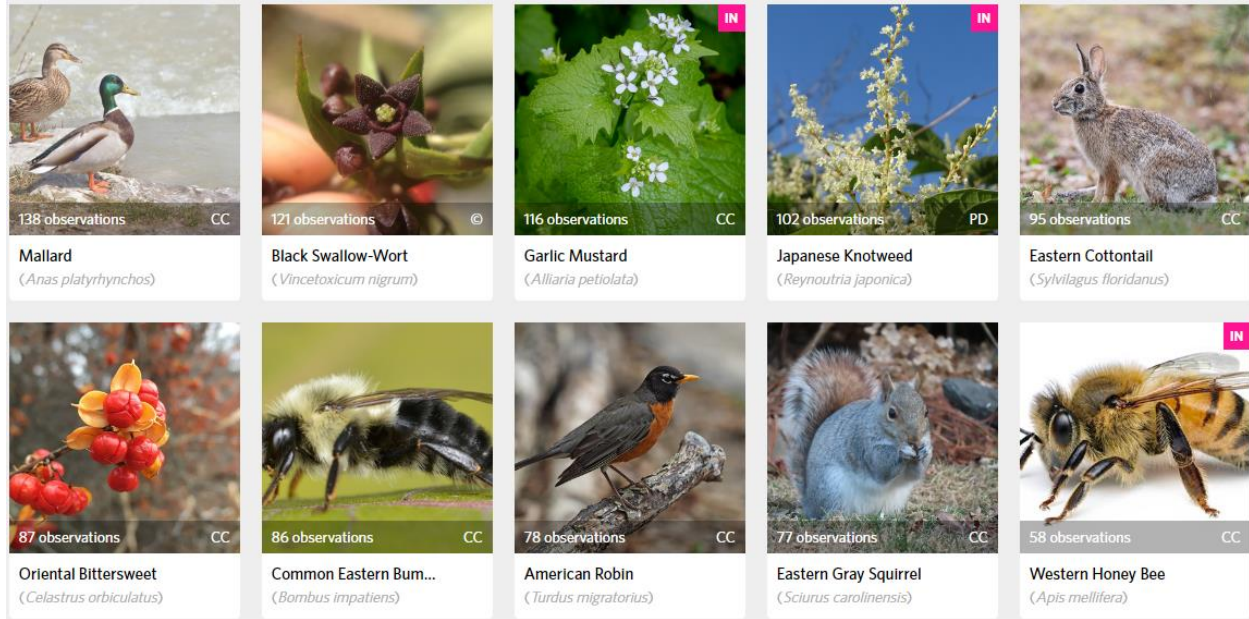


Arlington, sited on Pawtucket and Naumkeag lands, was first called Menotomy, an Algonquian word popularly understood to mean “swift running water,” likely in reference to Mill Brook, which bisects the town. The municipality is 5.5 square miles large and home to 46,308 residents at the 2020 census. Arlington Heights in the west is the neighborhood with the highest elevation. East Arlington is lowest. Owing to glaciation, the town slopes from west to east, with important consequences for ecological management. Water moves downhill along the same course and from rocky, less permeable land in the Heights to infiltrate in the sandy soils or reach the water bodies in East Arlington. In between, the town has been heavily developed, largely for single family homes. This condition shapes Arlington’s ecologies—past, present, and potential. Habitat is restricted to open space parcels, which are few and typically reserved for active recreation. Corridors between habitat patches have not been mapped but exist along roads and waterways.



What is missing from Town planning is a landscape scale understanding of Arlington’s ecologies and how the Town relates to them vis a vis management actions. Town plans deal with discrete problems independently, moving from goal setting to action planning in a rational linear fashion. The interdependence of these problems can be lost in the details. A complex topic like biodiversity requires a holistic approach, one that looks between individual problems for creative solutions and that considers ecological issues at scale.

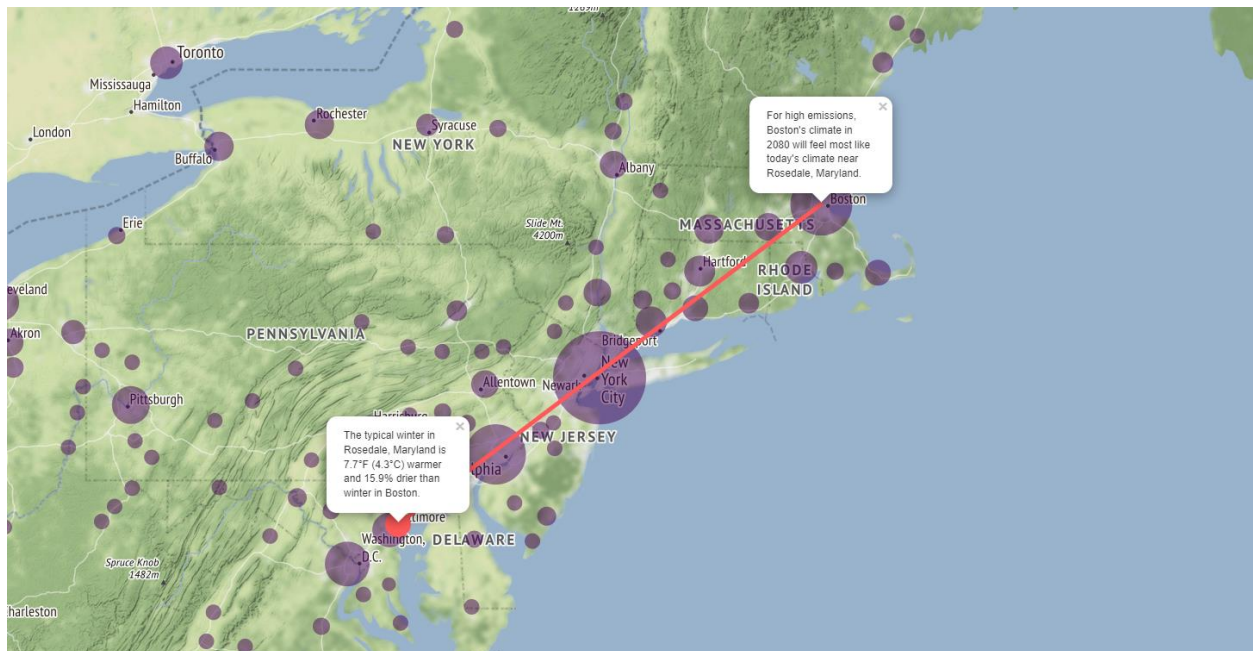
Above, data from iNaturalist are displayed, showing biodiversity observations made by participants in town. Notably, observations cluster around designated open spaces, but equally significant are the observations that do not. They point to the potential of the landscape beyond designated “natural” areas.



Unfortunately, many of the observations made on iNaturalist are of invasive species. This owes in part to a dedicated group of users who volunteer to manage invasives in town. It also shows the prevalence of invasive species and the difficulty in accomplishing ecological integrity in Arlington.

Project Description

By 2080, Arlington’s climate will be like that of Baltimore today, even with swift action on climate change mitigation. Adaptation is a must. The local ecology we rely on needs active management to transition, especially given our urban setting. The Urban Ecology Framework seeks to accomplish this in two ways.



First, the ecological land management actions outlined in Town plans will be drawn together. These actions include invasive species controls, planting guidelines, and open space area designations. Analysis will follow of Arlington's progress, where gaps exist, and what best practices can be proposed. The analysis will specifically focus on opportunities for biodiversity enhancement.

Second, the research will turn to Arlington's landscape ecology and determine where biodiversity planning should be focused. These findings will be made spatially explicit using GIS. The purpose of the second task is to identify opportunities for habitat and landscape connectivity, critical elements of promoting biodiversity. Data and methods for the task derive from regional conservation initiatives including The Nature Conservancy's Resilient and Connected Landscapes and the U.S. Fish and Wildlife Service's Nature's Network. The inputs to be considered include land cover, ecological integrity, and habitat connectivity. The results of the analysis will determine site selection criteria. Given different landscape potentials that this process will identify, Arlington may choose to prioritize actions or projects.

Project Deliverables

The final report will be submitted as an Urban Ecology Framework for the Town of Arlington. The framework components are the efforts taken by the Town to date and the analysis of local ecologies that points to potential future work. The below scope of deliverables includes optional work products that can be produced at the students' discretion. The optional deliverables are italicized.

- Inventory of Ecological Land Management Actions in Town Plans
 - Implementation table including timelines and progress for the above actions
- Gap Analysis of Ecological Land Management Actions in Town Plans
 - Best practices to be included in the Urban Ecology Framework
 - *Site specific best practices to be employed on Town-owned properties*
- Landscape Ecological Analysis in GIS
 - Map of relative ecological integrity within Arlington
 - Map of habitat patches and corridors
 - *Recommended interventions, including identification and prioritization of site selection criteria*

The deliverables will partially fulfill Town plans to enhance the local ecological integrity and promote biodiversity.

Contact Information

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